Kuhner shaker

Learn and Connect

25 Nov 2026



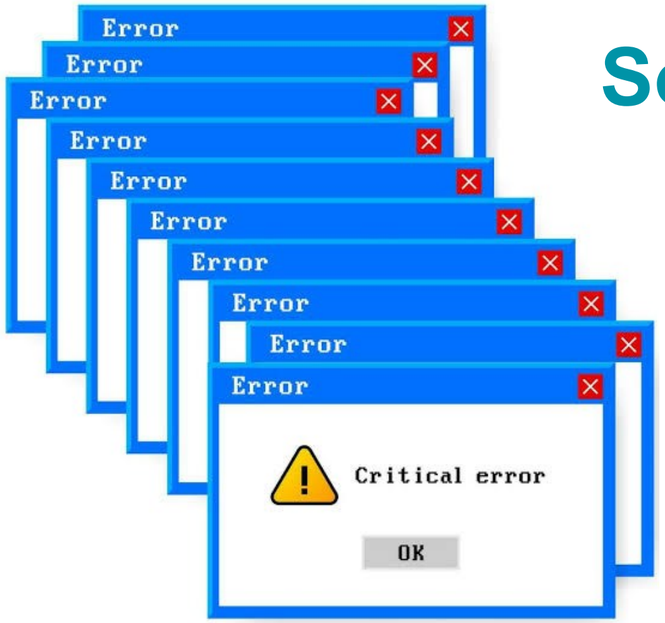
I can only imagine how busy you must be

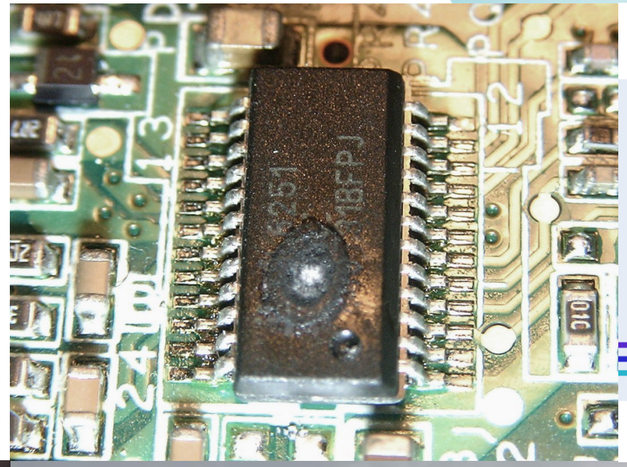
- Setting goals
- Design of Experiments
- Execution
- Data analysis
- Admin

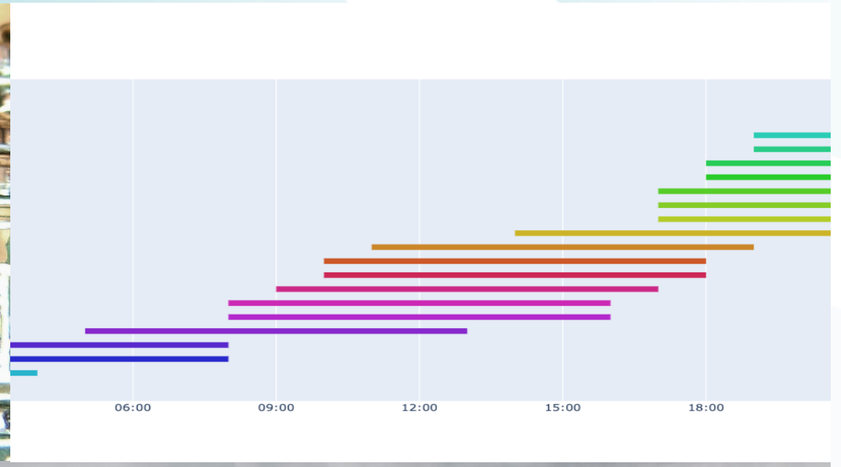




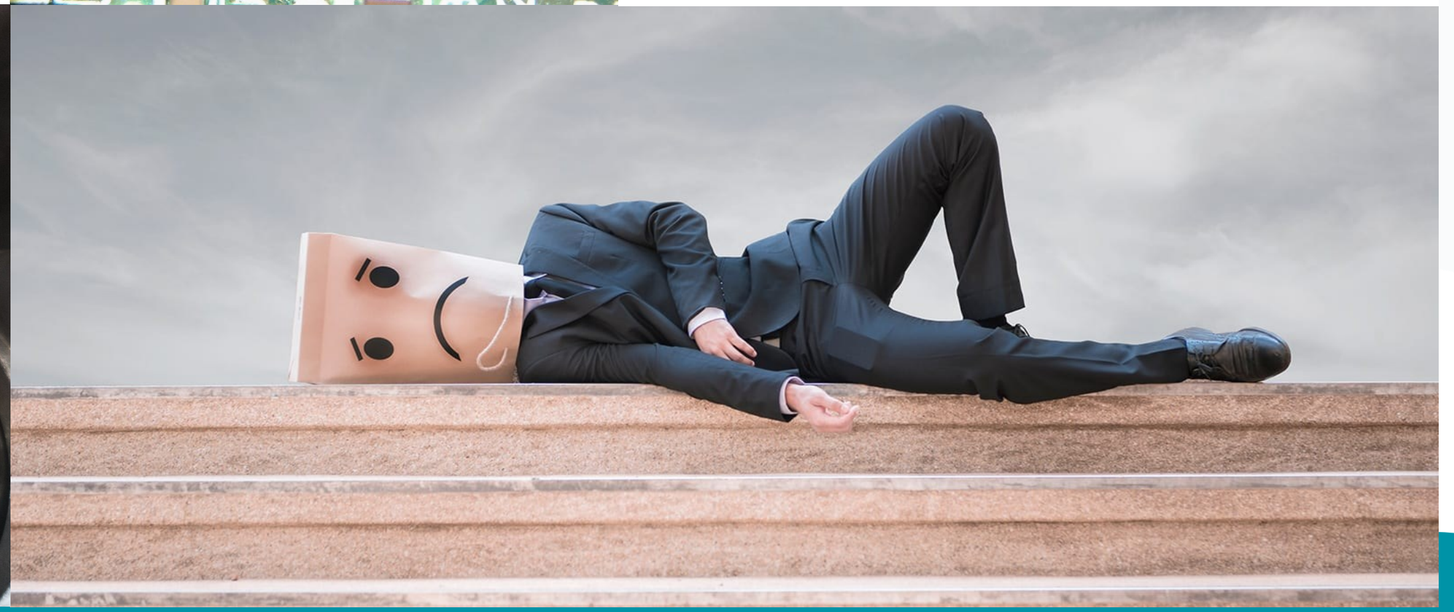
So this must be the last thing that you need











So next to CAPEX, also consider the cost of OPEX!

Kuhner AG

Our motto: To build the world's most reliable shakers

Kuhner shaker · since 1949

Kuhner AG leads the world in quality and technology for shaking machines. The "Kuhner shaker" name stands for functionality, reliability and durability.



Kuhner shaker

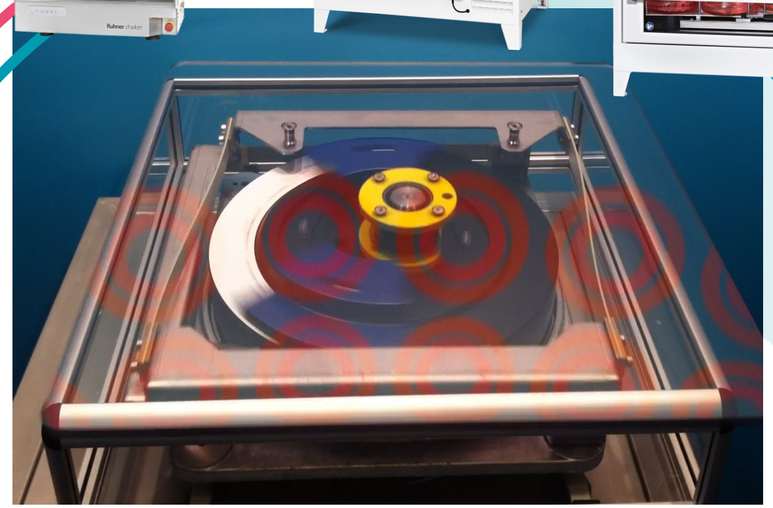
Ultra reliable & precise

LS-Z with Kelvin+



LT-X





ISF1-Z



LS-Z



ISF4-X



SR200-X



MPS-Z



RC2-X







5 YEAR

Kuhner shaker

Automation

- Not only data and control, but also robotization

- Why robotization?
  - Remove repetitive labor
  - Prevent person-to-person variation
  - Increase throughput
  - 24-7 operation

  - -> there is already so much to do!





Introducing: a roboticized shaker incubator



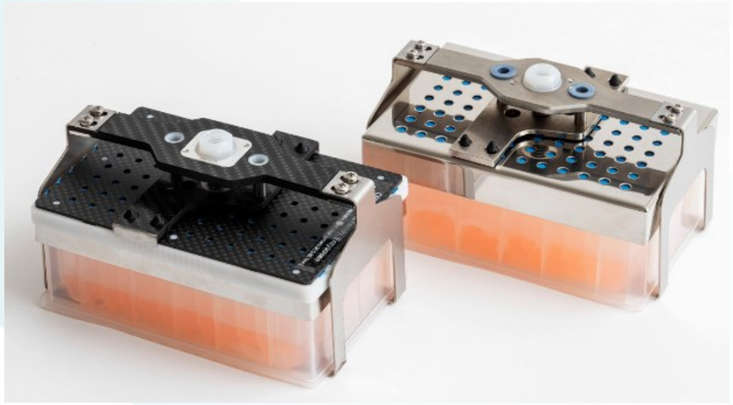
- Capacity: 16 plates
- Precision control for temperature, humidity, CO_2, shake speed
- Temperature: 30C up to 40C
- Peltier technology for active humidity control and cooling (temp shifts possible)
- Humidity control up to 85%
- CO_2 control: 0-20%
- Direct magnetic drive with adjustable orbits: 3, 6, 12.5, 25, 50mm
- Standard with TPS+ (Tray Positioning System) – precise position stopping
- Built-in SCARA, Kuhner Hawk – robotic handling
- Interfaces: Ethernet TCP/IP WebSocket with ASCII Protocol or SiLA2 (HTTP/2)
- Duetz compatibility
- 110V, 15 / 20amps

MPS-Z: 16 plates – regular 96 & 24 deep well plates plus ‘mid-height’ 6WP & 2DWP

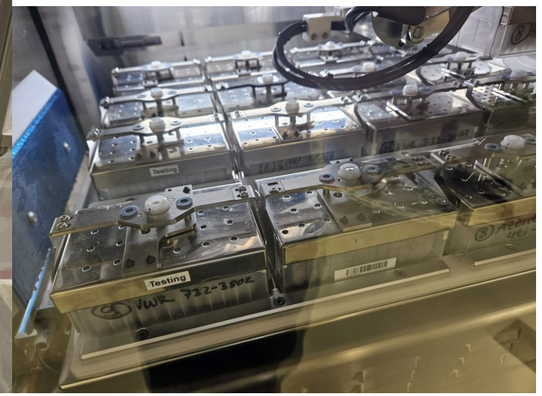




Duetz compatibility





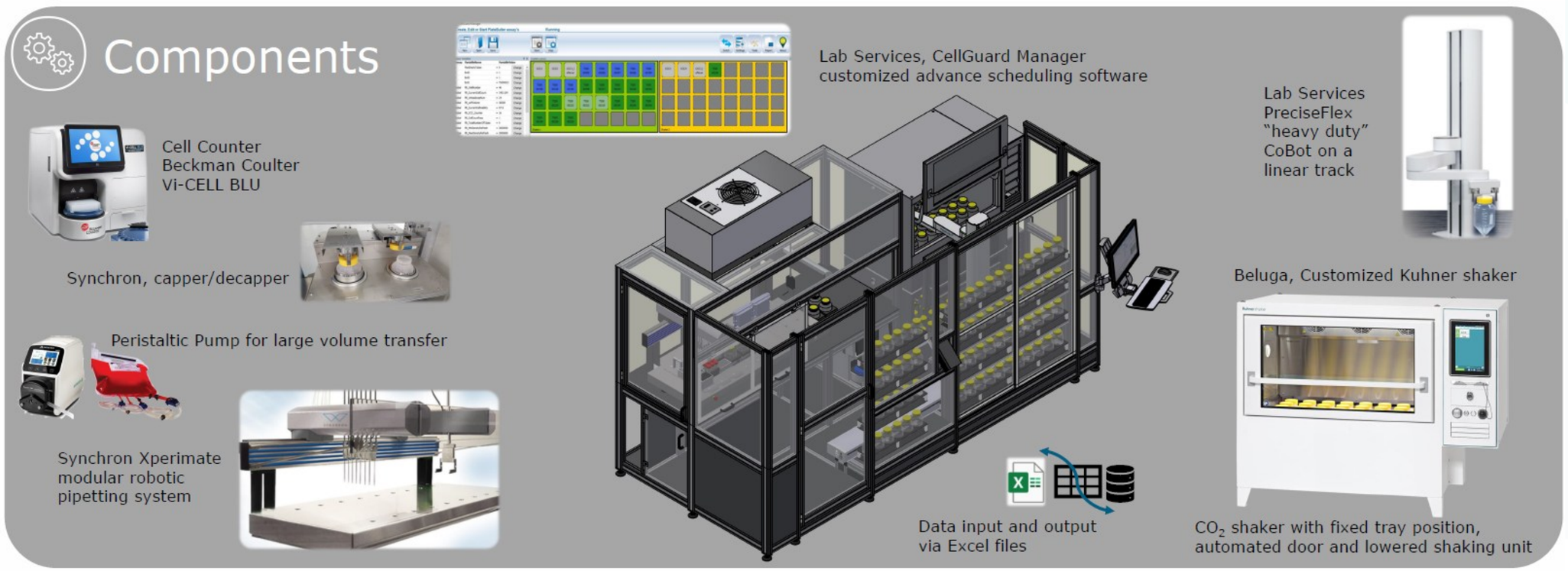


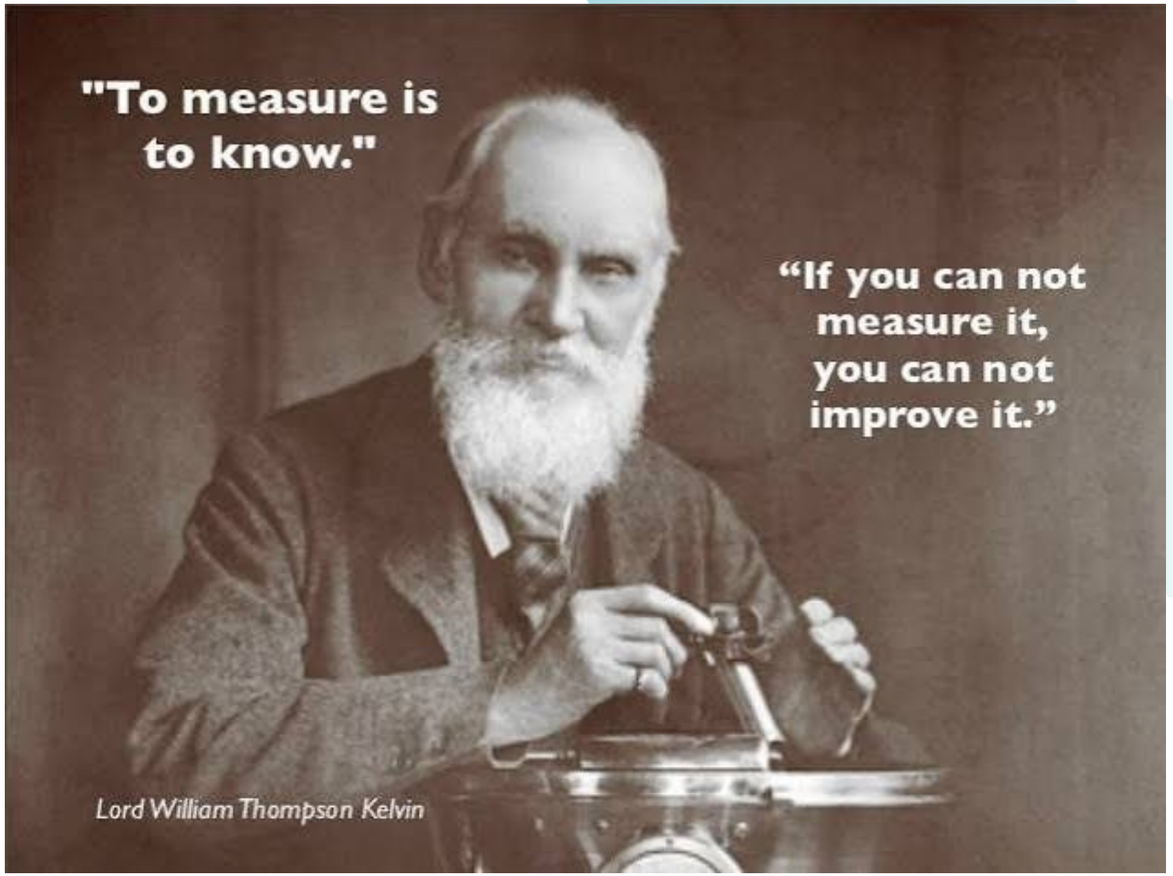
MPS-Z / cultivation

LH / e.g. media exchange / charactarization

Partnership with Lab Services

CellGuard automation process of large-scale suspension cell culture for transient protein expression in partnership with Lab Services (Netherlands)



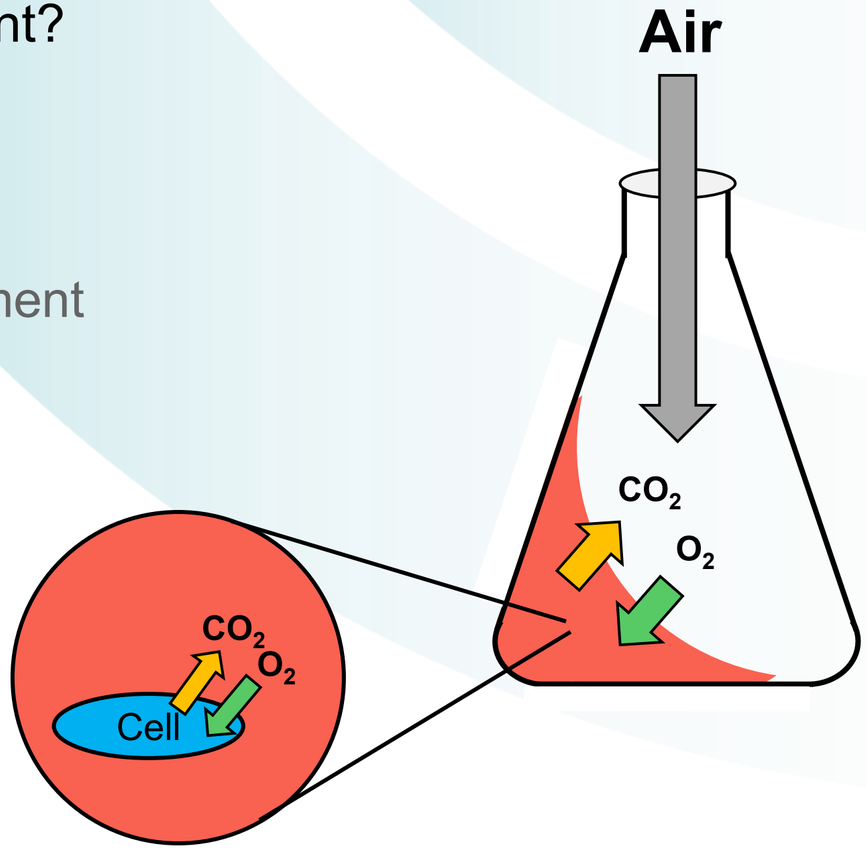

"To measure is to know."
"If you can not measure it, you can not improve it."
Lord William Thompson Kelvin

Gas Monitoring System

Why is Respiratory Activity Monitoring System important?

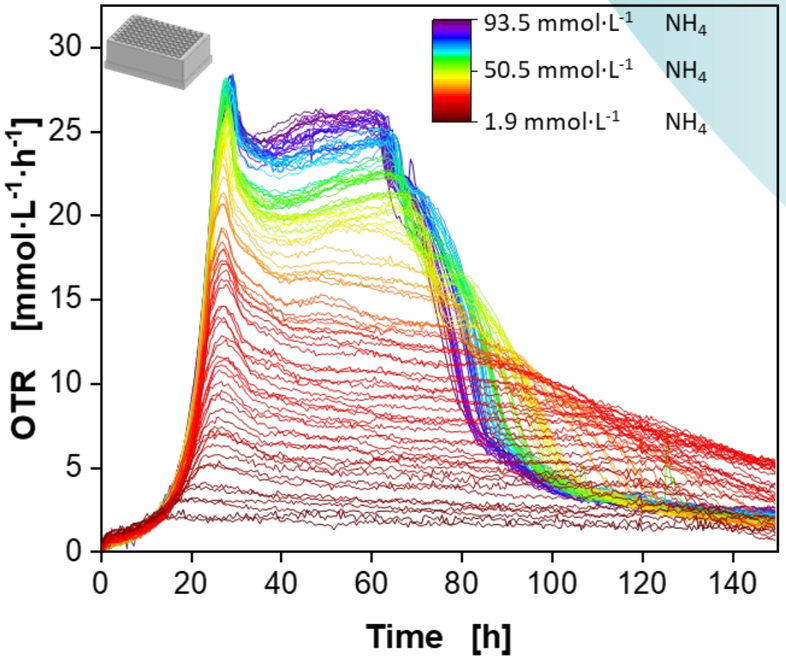
- Bioreactor data for your flask
- Oxygen Uptake Rate
- Calculation of Respiratory Quotient
- Bring screening and development scales into alignment





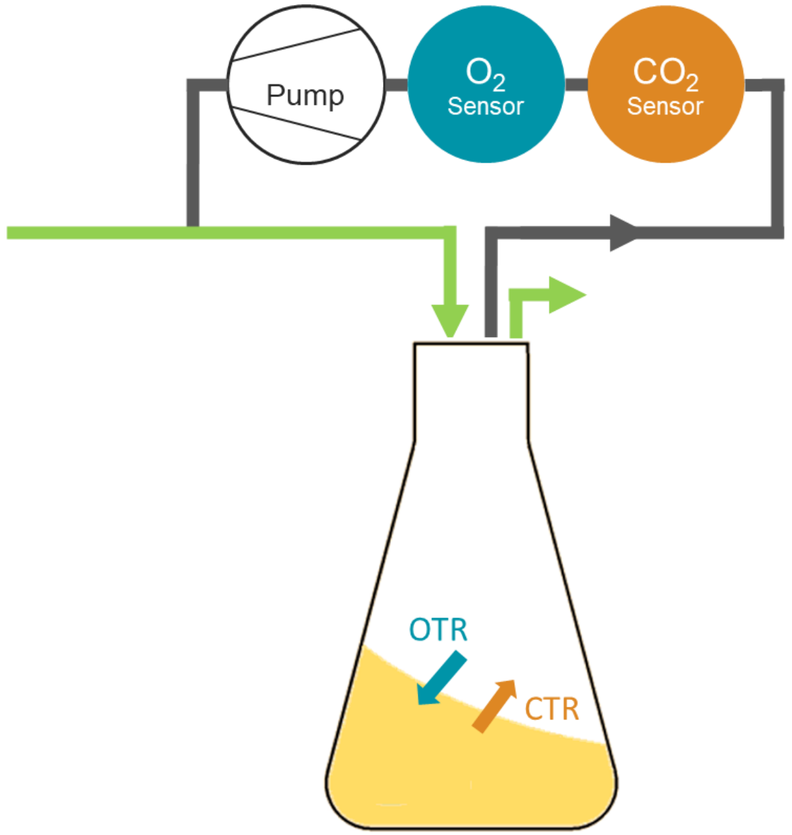
Kuhner microTOM and TOM

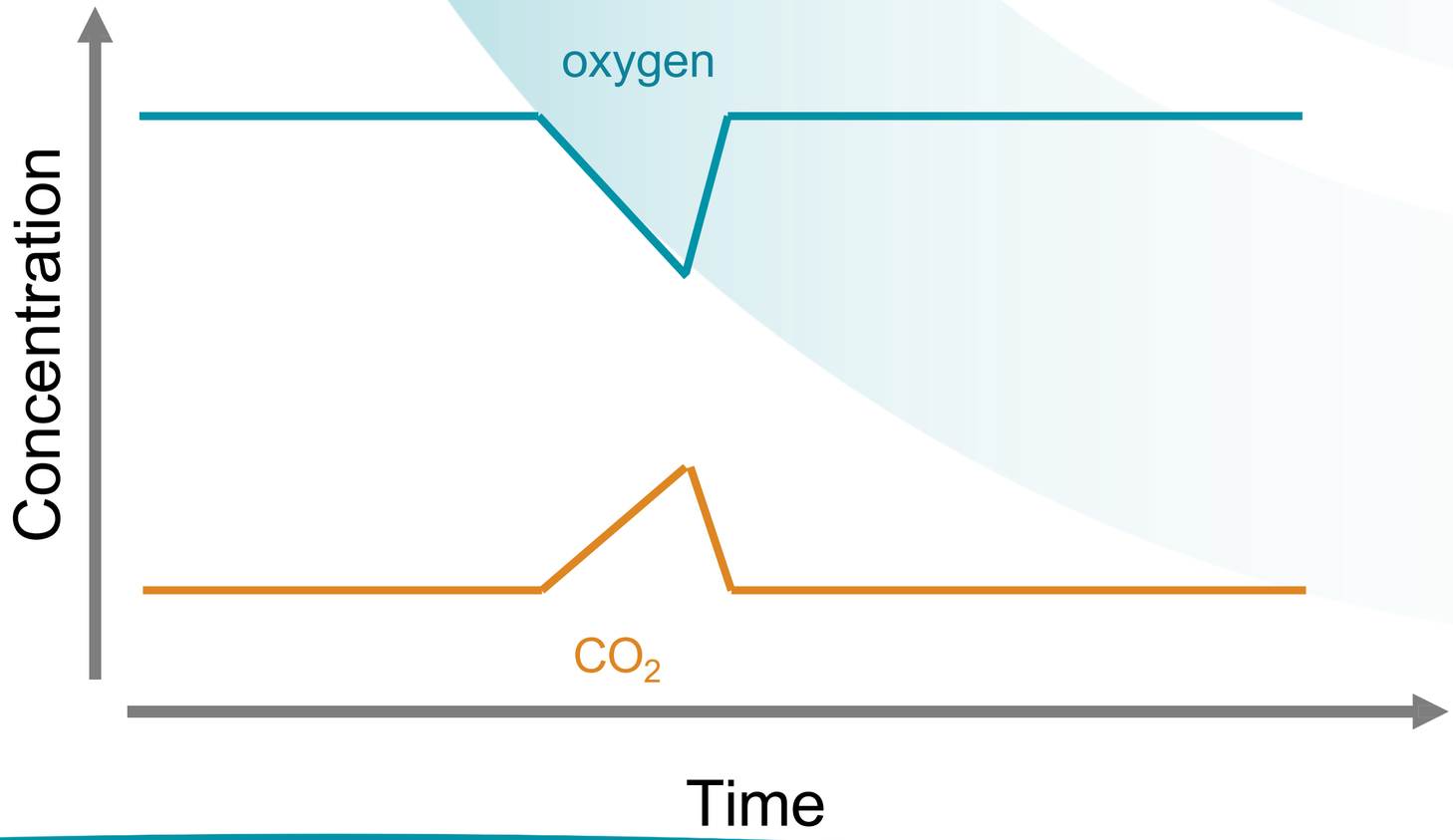




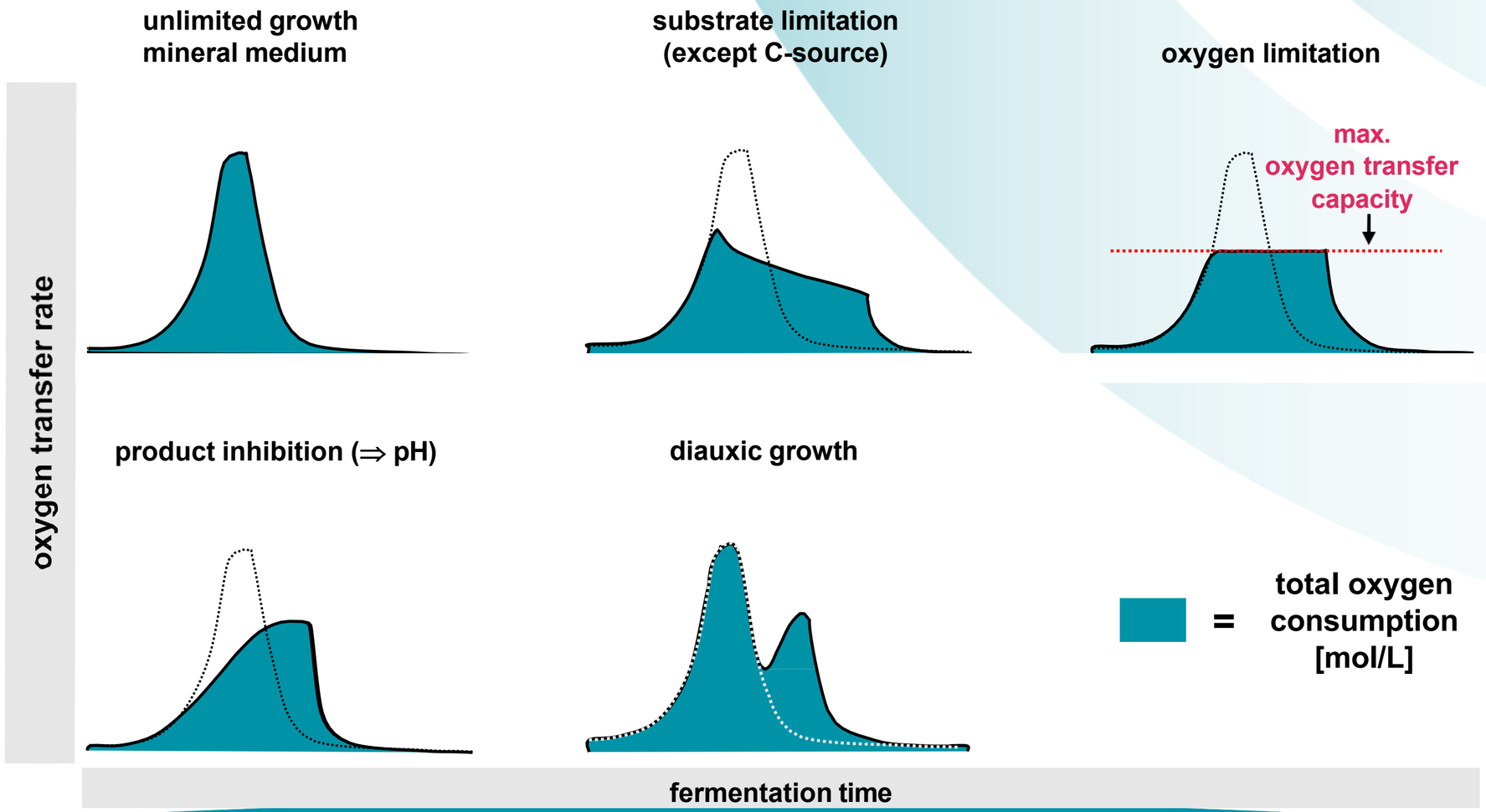


TOM is measuring oxygen consumption and CO_2 production





Interprete Oxygen transfer rate

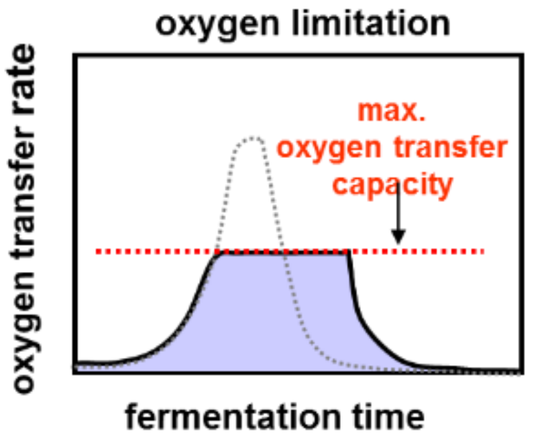


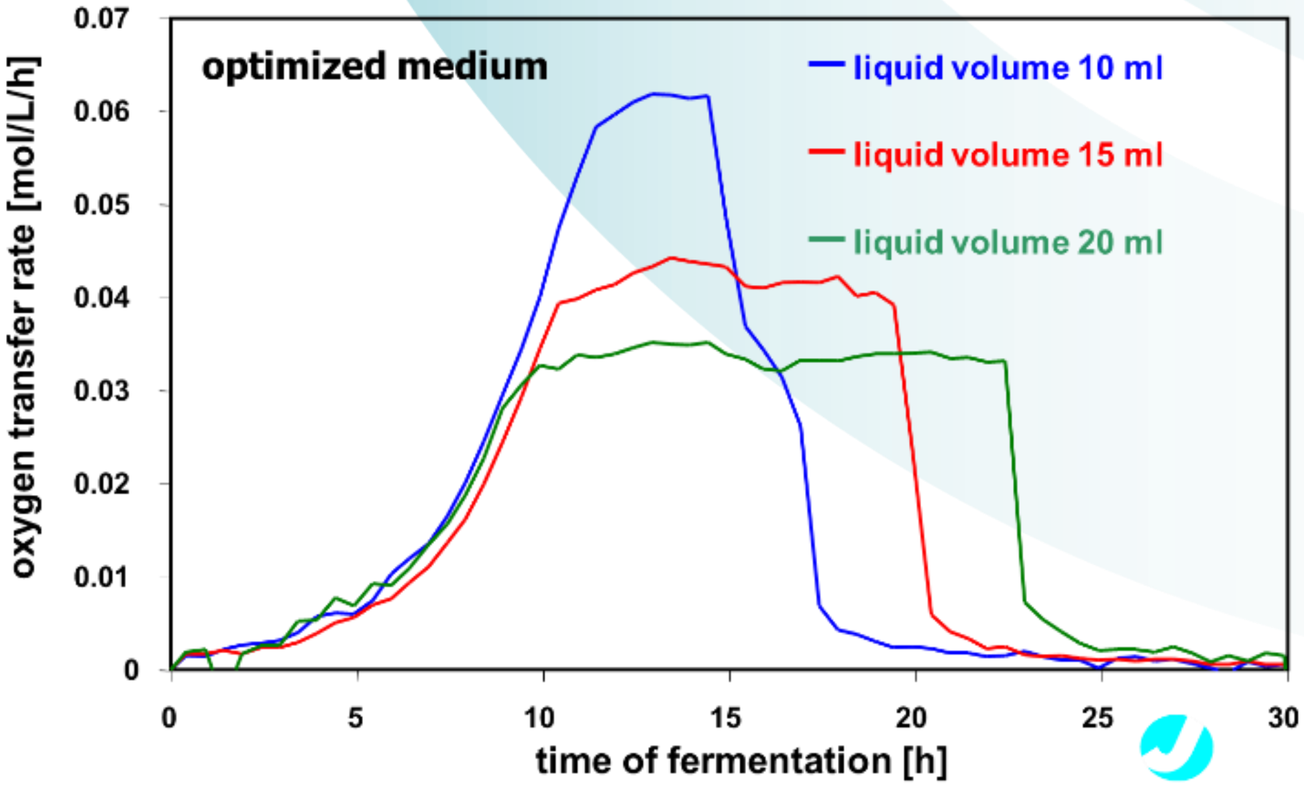
Anderlei, Tibor & Büchs, Jochen. (2000). Device for sterile online measurement of the oxygen transfer rate in shaking flask. Biochemical Engineering Journal. 7.

Development & Optimization

Corynebacterium glutamicum

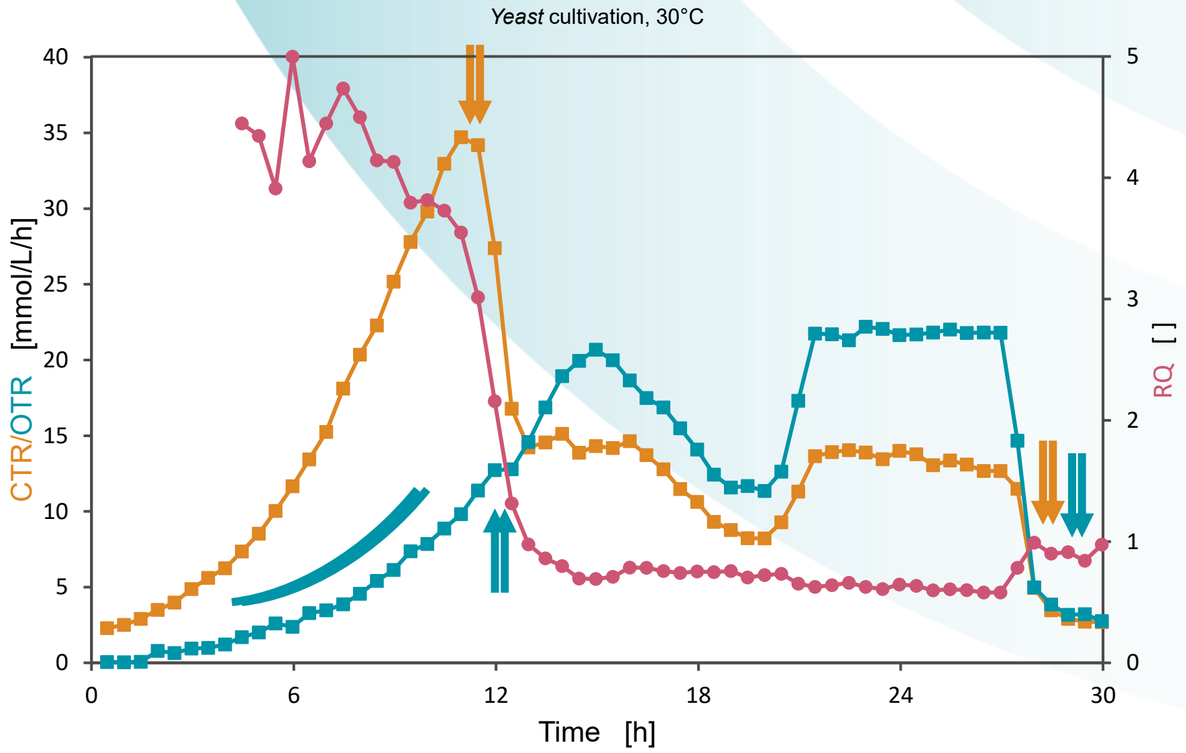
30C, minimal medium,
300rpm, 50mm, 250mL





Media Development

- Exponential growth
- Preculture termination
- Oxygen limitation
- End of process
- Depletion of glucose
- Total carbon consumption
- Consumption of ethanol

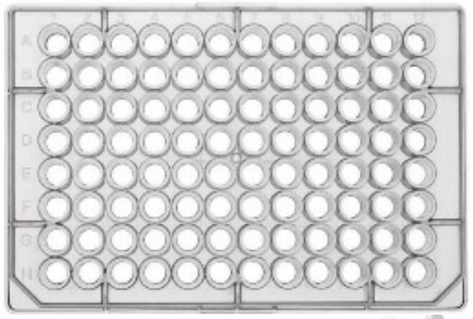


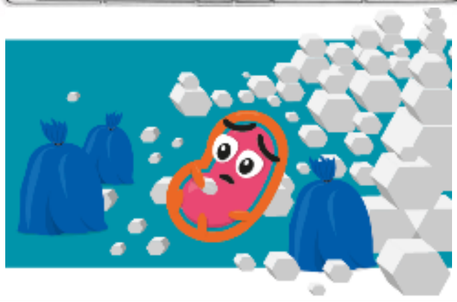


Why should a fed-batch mode be applied in small scale?

Selection of suboptimal production strain!

Screening in Batch mode





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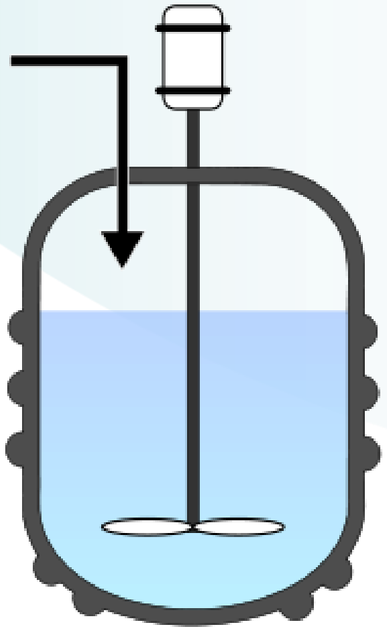
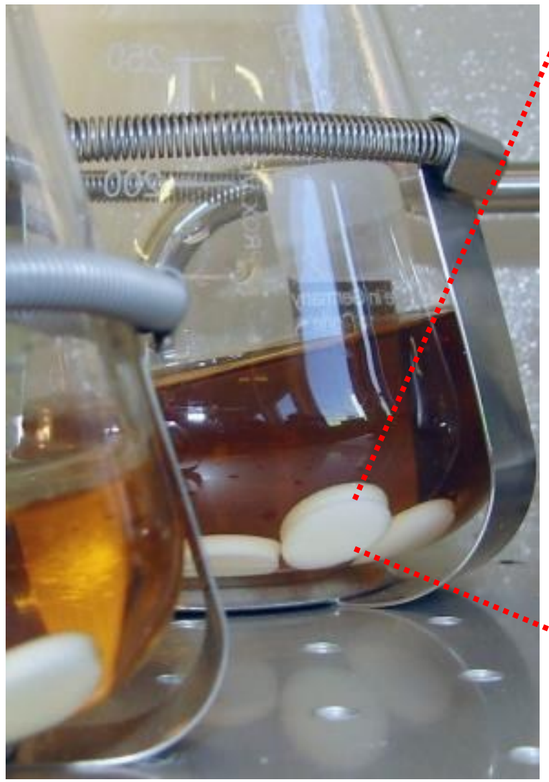
Different physiological conditions and performance of strains!

Production in Fed-batch mode



Feed Beads

Fed batch slow release for flasks



- Polymer discs containing glucose – added to flasks and small vessels
- Release glucose at fixed rate
- Easily integrated into standard laboratory equipment
- Adaption of cultivation conditions between screening and large scale
- Improving screening conditions
- Get more reliable screening results







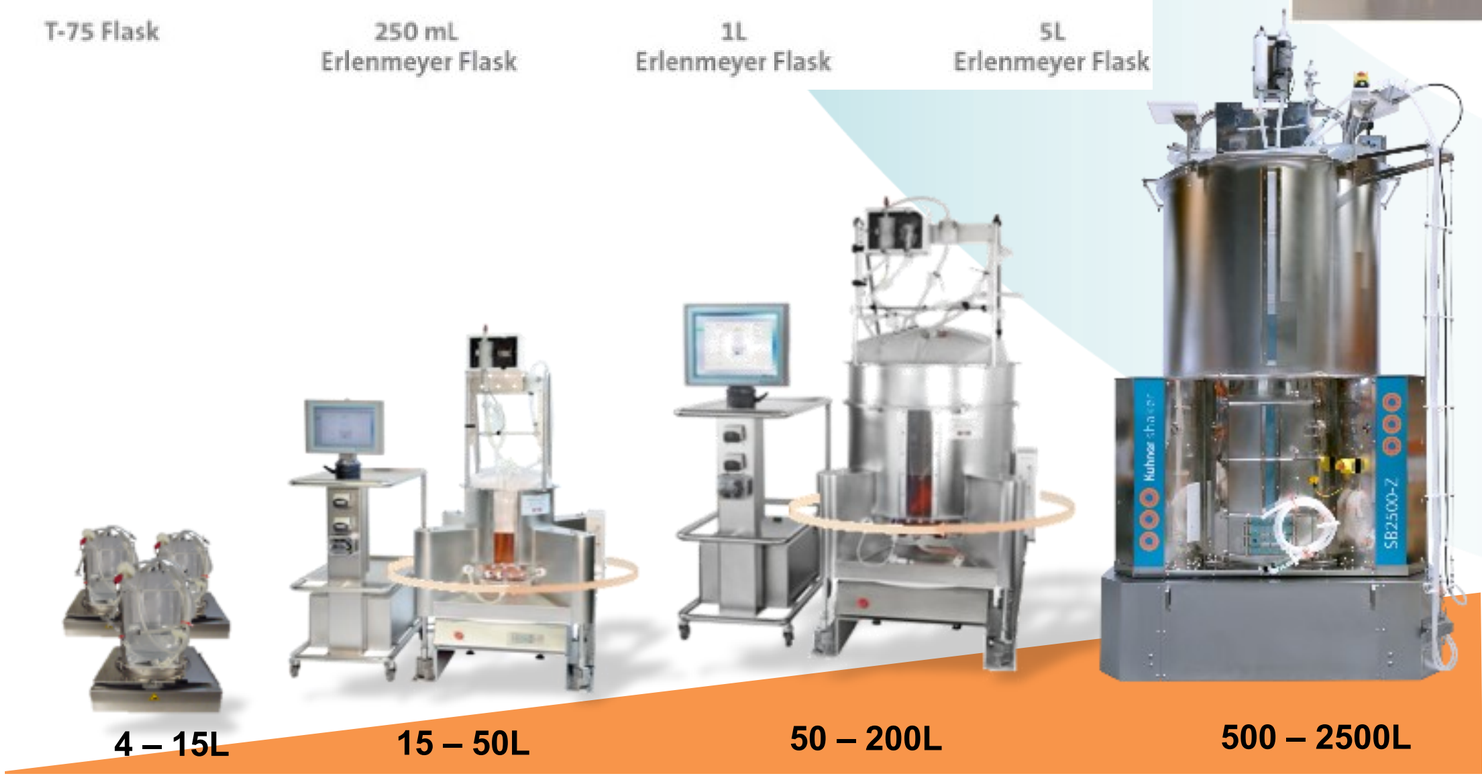
Scale up



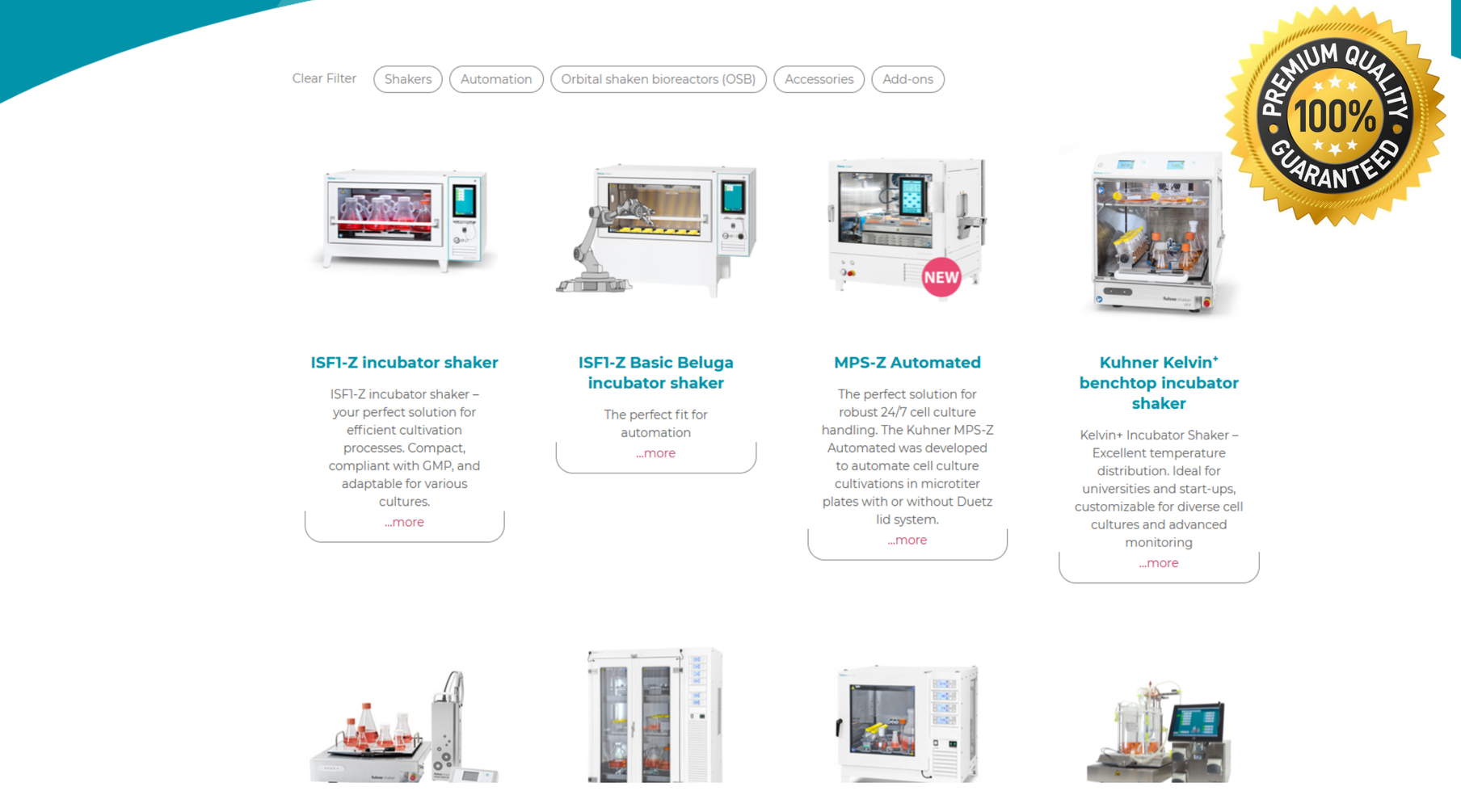
Orbital Shaken Bioreactor Scaling







Clear Filter | Shakers | Automation | Orbital shaken bioreactors (OSB) | Accessories | Add-ons



ISF1-Z incubator shaker

ISF1-Z incubator shaker – your perfect solution for efficient cultivation processes. Compact, compliant with GMP, and adaptable for various cultures.

...more

ISF1-Z Basic Beluga incubator shaker

The perfect fit for automation

...more

MPS-Z Automated

The perfect solution for robust 24/7 cell culture handling. The Kuhner MPS-Z Automated was developed to automate cell culture cultivations in microtiter plates with or without Duetz lid system.

...more

Kuhner Kelvin+ benchtop incubator shaker

Kelvin+ Incubator Shaker – Excellent temperature distribution. Ideal for universities and start-ups, customizable for diverse cell cultures and advanced monitoring

...more

